REMARKS

Claims 1-26 are pending in this application. Claims 1, 8, 11, 18 and 22 have been amended. Applicants reserve the right to pursue the original claims and other claims in this application and in other applications.

Claims 1-15 and 18-21 stand rejected under 35 U.S.C. § 103(a) as being obvious over North (U.S. Patent No. 6,081,558). Reconsideration is respectfully requested.

Amended independent claim 1 recites a method of "changing the gain of an amplifier in a gain stage of a sensor in response to a signal read out from a pixel array in the sensor, wherein said gain stage is in an output path to an analog to digital converter for readout."

Amended independent claim 8 recites a method "applying said two or more bias currents to a plurality of parallel transistors in an amplifier in a gain stage of the sensor in order to change the input transconductance of the amplifier, wherein said gain stage is in an output path to an analog to digital converter for readout."

Independent claims 11 and 18 recite a gain stage "wherein said gain stage is in an output path to an analog to digital converter for readout."

North discloses a method and apparatus for operating an infrared optical communications receiver at low power during periods when no optical transmission activity is present. The object of the North disclosure is to control the power level based on activity levels, e.g., if there is no signal input above a certain threshold, then the signal will remain in an inactive state to indicate no activity is present and thereby power down the circuit. (col. 7, lines 34-57). An automatic gain control (AGC) employed by North is located outside the direct signal path (col. 7, lines 56-57) and is part of a feedback loop (col. 5, lines 13-15).

North does not teach or suggest all the limitations of independent claims 1, 8, 11 or 18. The AGC of North is located outside the signal path and does not lead directly to an output. Instead, the AGC of North is used in a feedback loop adjacent a comparator. The AGC of North is utilized to control power when no infrared signal is present. In contrast, the present Application discloses a gain stage "wherein said gain stage is in an output path to an analog to digital converter for readout."

Further, North discusses an infrared receiver, whereas the present Application recites "a pixel sensor array." As indicated in the Office Action, North does not teach a pixel array, and therefore has no teachings which are relevant to operation of such an array. Particularly, North does not teach or suggest a gain adjusted system responsive to pixel output signals and also fails to teach changing power consumption in response to a change in gain.

North does not teach or suggest the limitations of the present invention. It would not have been obvious to one skilled in the art to arrive at the Applicant's invention from the unrelated disclosure of North. North discusses an infrared receiver that uses an AGC system in a feedback loop in order control power level based on activity. The disclosure of North would have no relation to the present Application which discloses a pixel array having a gain stage that is responsive to pixel output signals and is in an output path to an analog to digital converter. The above discussed limitations are not present in, or obvious from, North and therefore, the Applicant respectfully requests that the rejections of independent claims 1, 8, 11 and 18 and respective dependent claims 2-7, 9-10, 12-15, and 19-21, be withdrawn.

Claims 16-17 stand rejected under 35 U.S.C. § 103(a) as being obvious over North in view of Kozlowski (U.S. Patent No. 5,892,540). Reconsideration is respectfully requested.

Claims 16-17 depend from claim 11 and are allowable at least for the reasons argued above. Additionally, Kozlowski discloses a system for managing low noise readout

in an imager having passive pixels and includes a variable capacitance amplifier. Kozlowski fails to disclose or suggest 'an active pixel sensor array' 'a gain stage for a sensor, wherein said gain stage is directly in an output path to an analog to digital converter for readout and said gain stage having a differential amplifier including a gain selector operative to select one of a plurality of gain settings in response to a signal from a pixel array,' 'an input transistor of a sensor having a variable input transconductance,' and a 'transconductance controller of a sensor operative to select an input transconductance of the input transistor in response to a selected gain setting.'

The Office Action asserts that it would have been obvious to one of ordinary skill in the art to use the switches of Kozlowski in the apparatus of North, to provide a simple, cost effective method of dynamically modifying the gain for a feedback amplifier. First, neither North or Kozlowski teaches or suggests the limitations of independent claim 11. Second, a person skilled in the art would not have been motivated to combine the teachings of North with those of Kozlowski to arrive at the claimed invention. As argued above, there is no motivation to applying the teachings of the North invention which describes an infrared receiver device to the teachings of Kozlowski which describes a passive pixel sensor array; neither of which address adjusting amplifier power consumption in a sensor having an active pixel sensor array as the present Application does. Accordingly, withdrawal of the rejection of claims 16-17 is respectfully requested.

Claims 22-26 stand rejected under 35 U.S.C. § 103(a) as being obvious over Williams (U.S. Patent No. 5,864,416). Reconsideration is respectfully requested.

Claim 22 recites, inter alia, a method comprising "changing the gain of an amplifier in a gain stage of a sensor in response to a signal read out from a pixel array in the sensor; and changing a gain bandwidth (GBW) of the amplifier in the gain stage in response to changing the gain."

Williams discloses a tunable, multi-octave optical communications receiver.

Williams does not disclose 'changing the gain of an amplifier in a gain stage of a sensor in response to a signal read out from a pixel array in the sensor' or 'changing a gain bandwidth (GBW) of the amplifier in the gain stage of a sensor in response to changing the gain.' As indicated in the Office Action, Williams does not teach the sensor element as part of a pixel array, and therefore has no teachings which are relevant to operation of such an array. Particularly, Williams does not teach or suggest a gain adjusted system responsive to pixel output signals and also fails to teach changing gain bandwidth in response to a change in gain.

Claims 23-26 depend from claim 22 and include additional limitations. For at least the reasons stated above, the Applicant respectfully requests that the rejections of independent claim 22 and respective dependent claims 23-26, be withdrawn.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Dated:

Respectfully submitted,

By_____

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